1988

CHAR: The Fire Investigators Aid the Implementation of Expert System

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CHAR: THE FIRE INVESTIGATOR'S AIDE
THE IMPLEMENTATION OF AN EXPERT SYSTEM

BY

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B.E.T., University of Central Florida, 1983

RESEARCH REPORT

Submitted in partial fulfillment of the requirements
for the degree of Master of Science
in the Graduate Studies Program
of the College of Engineering
University of Central Florida
Orlando, Florida

Spring Term
1988

ABSTRACT

The purpose of this research is to determine the applicability of expert systems to fire investigation. This will be accomplished by:

a) using an expert systems building tool,

b) extraction and organization of the knowledge base,

c) application of the system to solve a real problem.

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I. INTRODUCTION

The advancements in the field of computer technology in parallel processing, microprogramming, co-processors, and fast memory chips have led to an increasing demand for more powerful and intelligent computer systems. During and since the 1960s, artificial intelligence has become a growing part of research and development in both government and private industry.

Artificial intelligence is the development of intelligent computer programs. The field of artificial intelligence includes the following areas:

Robotics

Expert Systems

Natural Language

Speech Processing and Synthesis

Machine Vision and Pattern Recognition

Intelligence refers to tasks that would require human knowledge and reasoning in order to perform them properly. These computer programs are heuristic in nature, involving complex symbolic manipulation and solutions that may be ambiguous. Table 1 shows a comparison between artificial

intelligent programming and conventional programming, which is more algorithmic in nature.

TABLE 1

COMPARISON OF ARTIFICIAL INTELLIGENCE WITH CONVENTIONAL PROGRAMMING

ARTIFICIAL INTELLIGENCE	CONVENTIONAL PROGRAMMING
Primarily symbolic process	Often primarily numeric
Heuristic search (solution steps implicit)	Algorithmic (solution steps explicit)
Control structure usually separate from domain knowledge	Information and control integrated together
Usually easy to modify, update and enlarge	Difficult to modify
Some incorrect answers often tolerated	Correct answers required
Satisfactory answers usually acceptable	Best possible solution usually sought

(Hunt, 1986)

Expert systems are artificial intelligence programs that record and access the expertise of a human in a particular field. They use knowledge and inference techniques to solve problems which would otherwise require human intelligent reasoning. They possess the characteristics of artificial intelligence programs as listed in Table 1 above.

The mechanics of the design of an expert system involve:

a) an artificial intelligence programmer to design the system tool,

b) a domain expert to provide the knowledge, and

c) a knowledge engineer to interview the domain expert and translate the knowledge into rules.

The knowledge of one or more experts may be captured in an expert system. This makes it possible for the non-expert to obtain general advice or information when an expert is not present. Since the system contains more than one person's knowledge, it is more effective in its conclusions.

II. DEFINITION OF THE PROBLEM

Fires usually destroy most of their evidence and may be caused by any number of sources. Therefore, the field of Fire Investigation relies heavily on experience and heuristic methods of problem solving.

A tiresome task of the investigator is to collect all available pieces of information. The work involves going through piles of charred debris to collect all pertinent pieces of information. He should be very keen and be able to eliminate irrelevant data. After gathering the data, the next step is to determine the relationship between the data and the source of the fire. In most fires, the findings usually end up in a court case, so the fire investigator needs to be accurate in his findings. The evidence should be free from prejudice and unbiased. As the data increase, the accuracy may decrease if some are inherently omitted.

CHAR, the system proposed here, attempts to assist the experienced investigator in organizing his data, and to reinforce his conclusions. For the rookie officer, CHAR

will provide a tutorial guide to help him solve real or simulated fires provided by his superiors.

To determine the cause/source of a fire, the following must be determined:

(1) the source of ignition,

(2) the material first ignited, and

(3) the defect, act or omission which led to the source of ignition and the material first ignited creating a fire. (Dennettt, 1980)

Because of the vast amount of knowledge needed to determine all three, the expert system developed here is limited to solving the source of residential fires only. Thus, the sources are limited to:

Electricity

Gas

Smoking materials

Solar radiation

Lightning

Hot surfaces

Spontaneous combustion

Electrical fires account for thirteen percent of all reported fires (Carroll, 1979), and may be caused by the overloading of a circuit or a malfunction in an appliance. Other causes of electrical fires may be the deliberate

substitution of a breaker with a higher ampere rating than the design rating of the circuit, short circuits, and incorrect wire size.

Gas fires start with an explosion. These explosions occur when the gas, usually from a leak, comes in contact with a flame.

Smoking materials: cigarettes, cigars and other such types, will cause a fire if smothered for about three to four hours. An example of this is, if a lighted cigarette is left in a sofa, it will produce a larger fire hours later.

Sunshine through a window, fish bowl, vase or any optical material that will converge rays, may cause a fire.

Lightning is one of the easiest sources to eliminate or detect. The activity of lightning in the area will be evident or recorded by the National Weather Service.

The class of hot surfaces includes fires caused by heat from heat producing objects such as hot water pipes, heaters, and the like.

Spontaneous combustion occurs from a chemical reaction which is exothermic. An exothermic reaction is one which gives off heat (Carroll, 1979). This may occur when oils

of high iodine value are soaked up in rags and left in a poorly ventilated area.

The sources mentioned above are limited and exclude burn pattern, flame color, and other miscellaneous causes.

The purpose of this research is to investigate the feasibility of procedures of an expert system that will assist a fire investigator on the job. The significant accomplishments of this work are the following:

a) feasibility of using expert systems techniques in fire investigation,

b) application of an expert system building tool, and

c) extraction and organization of the knowledge base.

III. TOOLS FOR EXPERT SYSTEMS DEVELOPMENT

The artificial intelligence programmer designs the inference engine and the environment in order for the knowledge engineer to develop the knowledge/data. When this design is such that it can be used to develop knowledge in more than one domain, it is called a system building tool.

As seen from Table 1, the control in the tool is usually separate from the knowledge, so the design time of an expert system can be reduced by using such a tool. It is also designed so that the knowledge engineer will not need to know much about the language in which it was designed. Instead, a type of knowledge engineering language is developed which does not require experience in LISP, Prolog or any other language. The programming tool reduces the coding and provides a support system for the finished package.

An expert system building tool contains an inference engine to perform reasoning, and a knowledge base builder and editor to aid the knowledge engineer in

recording the expertise. It usually exhibits the following characteristics:

- User friendly
- Makes use of confidence factors for uncertainty management
- Forward or backward chaining
- Designed in a language capable of symbolic processing.

Texas Instruments has developed a knowledge engineering language, Personal Consultant, which is the developmental tool used here. Personal Consultant was chosen as the tool because it has all the above features, may be used on International Business Machines (IBM) personal computers, and was available.

This tool employs backward chaining, but forward chaining rules may also be used. The knowledge is rule-based so that the rules are entered in the form of IF-THEN. The IF portion can be referred to as the antecedent and the THEN part as the consequent.

An example of the form of a rule is as follows:

a) In English,

```
RULE007 [CHARRULES]
-------
If 1) a broken fuse, and
   2) wire loose inside insulation,
Then there is strongly suggestive evidence (80%) that
     OVERLOAD.
```

b) In LISP,

```
RULE007 [CHARRULES]
-------
PREMISE:  ($AND (SAME CNTXT BROKEN-FUSE YES)
                (SAME CNTXT LOOSE-WIRE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT OVERLOAD TALLY 800))
```

Forward chaining uses facts to match IF-clauses. If all the IF-clauses are matched, then the rule is fired (Siegel, 1986). This is continued for all other facts until all rules are checked. Facts include the initial data, the requested data, and the THEN-clauses of fired rules.

In backward chaining the goals are matched with the THEN-clauses, and the IF-clauses of all those rules are matched with THEN-clauses until a rule is found with all IF-clauses as true (Siegel, 1986). That rule is fired and it continues to fire other rules in a forward direction.

In the rule above, to come to a conclusion, all rules containing BROKEN-FUSE and/or LOOSE-WIRE as the consequent are fired. For those rules to be fired, all the parameters in the IF-clauses must be available. If not, other rules are searched to determine if the present IF-clauses are contained in any THEN-clauses. Of course, if either is false, then the other is not checked. When a rule is designated as antecedent, the reasoning will

follow forward chaining; otherwise all inference in the Personal Consultant is backward chaining.

The structure of the Personal Consultant is such that a problem may be divided into sections, the main context and subcontexts. The main context will contain general knowledge about the area of expertise. During the solving of the problem, the information or data may need only a certain portion of the knowledge.

Dividing the problem into subcontexts not only helps with the organizational hierarchy of the system, but also provides an efficient way of accessing knowledge contained in the parameters and rules. Parameters are somewhat similar to variables in computer programs. Parameters may have values of "Yes," "No," or any other attribute that the designer may wish to assign to them. The attributes are set by the designer, but it is the user that determines the actual value that will be used at the time of execution. The user also determines the confidence factor. The section on development gives a clearer picture of the role of a parameter. Confidence factors are also described at that time.

IV. THE CHAR SYSTEM

Fire investigation is a field in which expertise is used to obtain solutions. This type of expertise uses a heuristic method which seems to be ideally suited for an expert system.

CHAR: THE FIRE INVESTIGATOR'S AIDE is developed to aid the fire investigator in determining the source of a fire. It may also be used as a teaching tool for new officers. In such instances the students may be given sample cases to solve, and then use the system to compare with their own solutions.

The knowledge of any expert is vast and not easily extracted and converted into computer language form. The use of rules is one way of representing knowledge to an expert system. A very large number of rules is usually needed to effectively capture any part of an expert's knowledge. CHAR contains ninety-eight rules.

Personal Consultant provides a way to divide the problem into sections that relate to different tasks of the problem. Each section or subcontext contains parameters and rules to solve that task. The subcontexts can also use rules and parameters from the main context.

In this research there is a main context and seven subcontexts. These rules and parameters are listed in Appendix B.

The structure of the context is as shown in Figure 2.

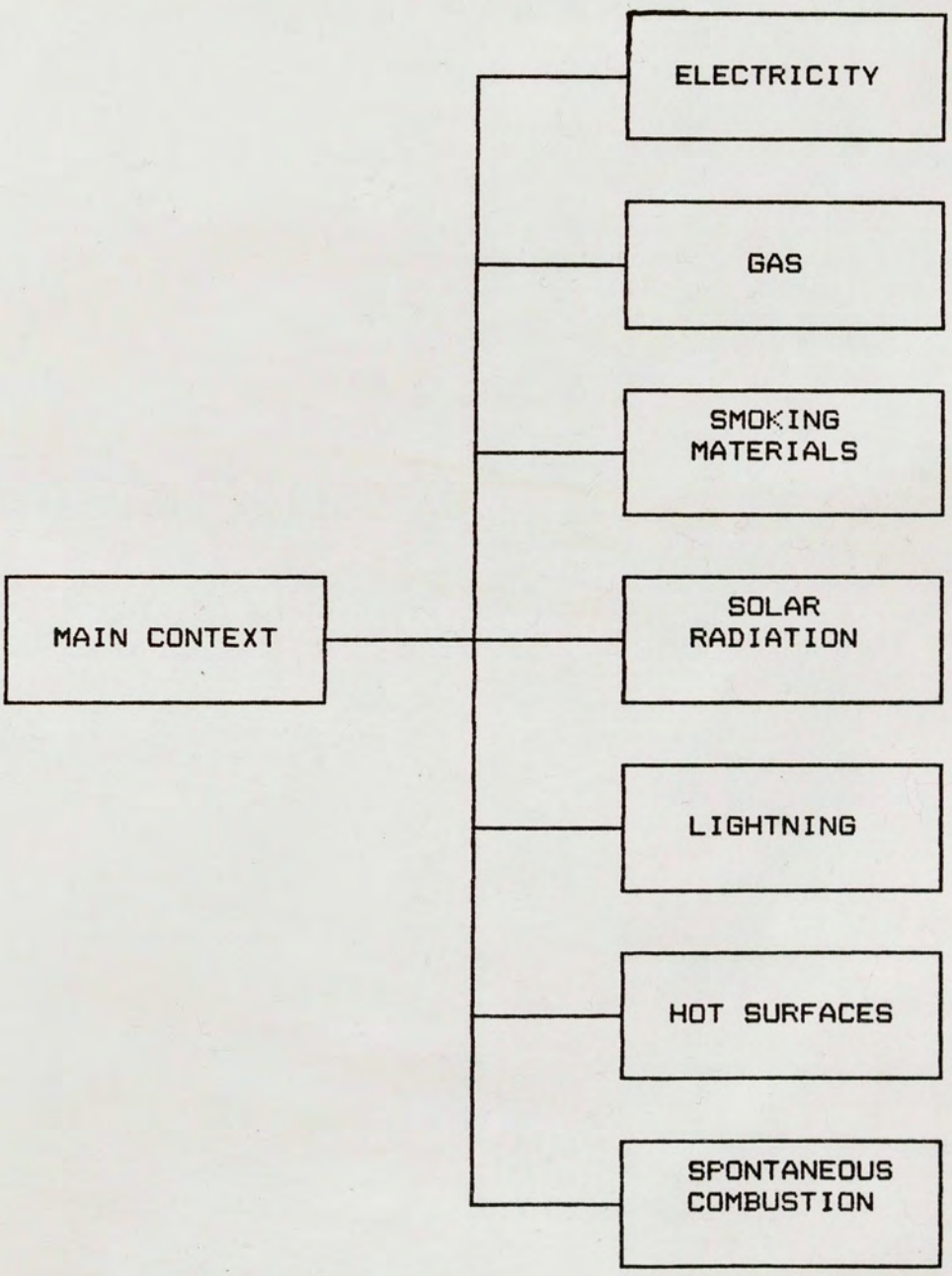

Figure 2. Fire Investigation Context Tree.

CHAR was developed on an IBM PC using Texas Instruments, Personal Consultant building tool. Expert opinion and information is being obtained from: a) Fire Investigation, M. F. Dennett; b) Fire Investigation, Paul L. Kirk; c) Physical and Technical Aspects of Fire and Arson Investigation, John R. Carroll; and d) Lt. John Hackett, Fire Investigator, Orlando Fire Department. Lt. Hackett was consulted during the project to provide expert input.

How does the system arrive at a conclusion such as spontaneous combustion? Spontaneous combustion is not frequently the cause of fire, but will always occur if the chemical and physical conditions are present.

For spontaneous combustion to occur, an oil with high iodine value, rags, and limited ventilation must all be present conditions. Some oils with high iodine value are linseed, cic, hemp-seed, perilla, stillinga, and tung.

A rule consists of three major parts:

a) the conditions,

b) the conclusion, and

c) the confidence factor.

The conditions are similar to those that a fire investigator will look for at the scene of a fire. There are many conditions by which a fire may be caused. These conditions, when combined in a multiplicity of ways, can

produce a large number of possible solutions. The rule structure to test for spontaneous combustion when linseed oil is present could be as follows:

```
RULE001 [SPON RULES]
-------
If 1) Rags were present and
   2) Linseed oil was present
Then there is strongly suggestive evidence (90%) that
   there was spontaneous combustion.
```

To come to a conclusion, both 1) and 2) must be true. First the system will prompt for rags being present. If the response is negative or very low belief, then the possibility of spontaneous combustion is ruled out. With a positive response, the system will also try to find a positive response for the presence of linseed oil. But, before the user is prompted for a value, all the rules are searched to see if there is one that will say that linseed oil was present. A rule such as this will test for it:

```
RULE008 [SPON RULES]
-------
If 1) Aroma of linseed oil was present, and
   2) Residue of linseed oil was present,
Then it is definite (100%) that linseed oil was
   present.
```

The system will prompt for a value for aroma and residue being present. With these two present, then the system will assume that linseed oil was present, and the user will not be prompted for linseed being present.

However, if linseed oil was not present, then, because rags were present, more rules containing other oils will be fired, such as:

```
RULE002 [SPONRULES]
-------
If 1) Rags were present, and
   2) Cic oil is present,
Then there is strongly suggestive evidence (85%) that
  the cause of fire was spontaneous combustion.

RULE005 [SPONRULES]
-------
If 1) Rags were present, and
   2) Any oil with a high iodine content is present,
Then there is strongly suggestive evidence (80%) that
  the cause of fire was spontaneous combustion.
```

Whenever a rule that concludes that there is spontaneous combustion is fired and is true, then no more rules from that context are fired. This process is similar for all contexts. However, when the source is determined, then the consultation will be completed.

V. DEVELOPMENT AND APPLICATION

It may seem redundant to design an expert system when books are available, but that is not the case. To obtain any information from the book, one must search through the entire book. On the other hand, an expert system would request only the necessary information, and then process that data to solve the problem.

Once rules are designed and debugged, they can be packaged so that the end user can employ them with minimum computer training. To use the system, the user should be prepared with all the information collected from the scene of the fire. On starting, the system will request data/facts by asking questions. The user will answer accordingly and may include a confidence factor depending on the level of belief placed on the knowledge.

The knowledge base consists of the main context and seven subcontexts as shown in Figure 2. The main context contains general knowledge about the domain and means by which the subcontexts may be instantiated. There are seven subcontexts, each containing knowledge about one of the following sources of ignition: electricity, gas,

smoking materials, solar radiation, lightning, hot surfaces/flames, and spontaneous combustion.

Two particularly useful characteristics of the design in this system are:

a) The rules for a context/subcontext are kept together in numerical sequence. This allows for easier editing, as well as for understanding the design of the system.

b) Each set of rules has a range of numbers allocated for it. Additional rules may be added without breaking the consecutive numbering. Ten or more rules may be added to each context type.

To allocate and access the range requires editing the knowledge base. Personal Consultant does not provide any means to omit numerical sequence. All rules are added by using the insert key and the system automatically numbers them sequentially. Also, once a rule is deleted, that number cannot be used again.

These inconveniences can be easily overcome by carefully studying the knowledge base, which is basically LISP code in a word processor editor. To allocate a range of numbers to a set of rules, the last line of the LISP coding, (SETQ RULENUM (QUOTE 23)), was edited to one less than the first number. (To start at rule number 160,

change 23 to 159.) Inserting a deleted rule would be similar in that the last line would be edited to one less than the rule number desired.

Although this seems to be a tiresome task, it creates a much more friendly environment for editing and documenting. Viewing the knowledge base in a word processor editor also provides easy access to edit rules that might have simple mistakes such as misspellings or omissions.

In order to design a heuristic system, the expertise has to be translated into a form that can be understood by a machine environment. The knowledge in this system was extracted by simulating the problem-solving techniques that are used by the expert. These solutions or conclusions were collected and recorded in the THEN portion of the rule.

Included with the conclusions are confidence factors. Confidence factors reflect the degree of belief that the solution is accurate. A fire investigator, however, does not normally speak in terms of confidence factors. He uses terms like "possibly," "definitely," and "not certainly." In this system, whenever these terms are encountered, they are translated into confidence factors.

Confidence factors, sometimes called certainty factors, range from 100% for most definitely, to -100% for definitely not.

The term "most definitely" was given a confidence factor range from 90% to 100%, "possibly" 75% to 89%, "not certain" 10% to 30%. Other confidence factors were assigned depending on the likelihood of their occurrence.

Each piece of information that is useful to the fire investigator is referred to here as a parameter. The solutions/conclusions are also included. The following example should give a clearer view of what a parameter is and how it is used:

```
APPLI-HEAT [CHAR-PARMS]
----------
TRANS:    (heat producing appliance)
PROMPT:   (If there is an appliance near the point of
          origin, is it heat producing?)
USED-BY:  (RULE010)
```

The parameter APPLI-HEAT has many features:

a) It may take on a value of YES or NO.

b) It has a translation which is an English phrase that describes the parameter. This is useful for referring to the parameter in a sentence for conclusions or when writing the rules in English form.

c) There is also an optional PROMPT feature that contains a sentence, usually a question, which will prompt the user for a value and confidence factor.

The structure of the context is such that its main part contains rules with parameters that will decide which of the subcontext groups needs to be instantiated to solve the problem quickly. The main context actually makes a preliminary conclusion of what the source may be. Thus, by instantiating the subcontext, which contains more rules with more detailed parameters, greater confidence may be placed on the solution.

To design the rules and the parameters, knowledge about fire investigation was obtained from the sources mentioned above. Lt. Hackett was very helpful and advised on the accuracy of some of the information. For example, breakers were to be substituted for fuses. He also recommended two of the three books and made himself available for interviews. However, most of the knowledge in the system was obtained from the books. They listed the different causes of fire and their detection. Using this information, rules were made. Since all cases are not covered in each book, the knowledge from each was combined to form a collective unit.

Early in the preliminary testing, there were two or more possible conclusions with confidence factors that were sometimes too close. This problem was overcome by including more detailed rules for each source.

The material first ignited and the action or accident that led to the fire are not covered due to the time limitation on this research.

VI. RESULTS FOR SAMPLE RUN

The conclusion of the system after a consultation will be one of the seven sources. In the cases where there is insufficient information to come to a definite conclusion, the system will respond as being unable to do so. A sample of the output is listed at the end of Appendix A.

The first three items are used to identify the consultation, and are entered at the very beginning of the session. The conclusions are translated as:

SPON -- Spontaneous combustion

HOT -- Flammable material touching a hot surface or flame

ELECT-- Electrical failure

GAS -- Failure in the gas supply system

SUN -- The sun's rays focused on the material first ignited

SMOKE-- A form of smoking material

LIGHT-- Lightning

Listed in Appendix A is a report of a real fire that was already solved by the fire investigators. To test CHAR, the information contained in the report was used by a person who had no prior background in fire investigation or expert system design. The reason such a person was selected was to protect the result from biased responses to the system. From understanding and knowing the conclusions, a fire investigator or the knowledge engineer may inherently respond to the question based on preconceived ideas. Using the information from the report, the novice was able to answer the questions from the system. Both the report and CHAR concluded that the fire was started by a flammable material coming in contact with a hot surface.

An output of the responses of the user and the conclusions are in Appendix A.

VII. CONCLUSIONS

Expert systems can be used to help determine the source of a fire. The sample case used here is listed in Appendix A. The results are described in Section VI. The conclusions of CHAR and that of the user were similar, proving that the system is capable of aiding fire investigation. CHAR is able to provide fairly accurate conclusions as to the source of building fires.

One of the major obstacles in designing an effective expert system is the amount of time it takes. Figure 2 appropriately illustrates the time in person-years it takes to design different types of systems. The shaded area shows the range of effort that may be required in each category. An expert system that will provide a high level of intelligent reasoning needs a large amount of time dedicated to it. Because Fire Investigation may be classified as a very difficult problem and the time was limited, the effectiveness of CHAR is restricted.

Figure 2. Person-years Required to Develop an Expert System. (Waterman, 1986)

The field of Fire Investigation is very much suited for expert systems application, as the conclusions are based on experience and heuristic reasoning. This system is limited in that it fails to address the area of arson investigation. Arson investigation and the approach in solving it involves:

i) interviewing persons near or at the scene of the fire,

ii) determining if there was reason for malicious intent against the owner or others associated with the building, and

iii) the mental state of the arsonist.

Such factors are not easily captured in a rule environment. However, CHAR is able to successfully determine the source of fires. The system can be used to aid fire investigators and as a training tool for new officers.

APPENDIX A

SAMPLE PROBLEM

This is a supplement report to Orlando Fire Department Alarm #678, a house fire at 1234 Ample Drive at 0244 hours.

I was notified by the OFD dispatcher at 0253 hours requesting me to respond to the above address. I arrived on the scene at 0316 hours and met with the OFD District Chief. The chief stated that upon their arrival they observed a large volume of fire coming out of the rear portion of the house as well as through the front living room area. He stated that a 1 3/4" line was advanced through the front door of this structure and extinguished the fire in the living room, dining room, kitchen and family room. The chief stated that the house was occupied and that the occupants had evacuated the house immeditately prior to their arrival through the front .

At this time I interviewed the owner/occupant of this house. The occupant stated that she was in her bedroom sleeping with her husband when she awoke with difficulty breathing. She then stated that she woke her husband and two children and escaped the house through the front living room door. I then asked her where she observed the fire. She stated that she saw the main body of fire through the sliding glass doors in the West end of her family room. She stated that the house was already full of smoke when she woke, but the fire had not extended through the closed sliding glass doors until after she and her family escaped. I then asked her what she had been doing prior to the fire. The occupant stated that she had been ironing clothes in the East end of the family room until sometime after midnight. She then stated that she had given her husband some medicaton and sometime prior to 0100 hours she had unplugged her electric iron, turned off her kerosene heater, closed the glass sliding door to her family room and went to bed.

At this time I began my examination of the fire scene. The fire had caused severe fire damage in the living room, hallway, dining room, kitchen and family room. The three bedrooms had sustained serious heat and smoke damage. The fire had also extended into the attic region as well as the carport causing serious damage to these areas. Upon entering the structure through the front door I noticed that the fire damage in the living room, dining room and hallway was more serious at the higher levels. The furnishings sustained serious damage but were easily recognizable and obviously an extension of fire from another area of the house. As I walked from the living room to the dining room the fire damage got closer to the floor until it reached the floor level at the sliding glass doors separating the dining room from the family room.

The sliding glass doors had been in the closed postiion, but the glass had broken out and the glass was lying within the dining room. The aluminum framing on these doors was melted at the higher levels. At this time I entered the family room. This was a 10 x 20 wood frame addition to this house. The roof was constructed of 2 x 6, covered with plywood and the walls were constructed of 2 x 4 covered with plywood. All of there structural components were exposed and never covered with drywall or any other finishing covering. The fire had broken through the walls on the West end of the room. The roof was also more seriously damaged in the West end of this room. Upon checking this room for electrical wiring and receptacles I found only one electrical receptacle located in the existing South wall of this room. This receptacle had a television and lamp connected to it. These items were located along the East wall of this room These were the only items in this room, which were plugged into an electrical receptacle. The fire damage in the East end of the room was all extension. The items in this area only had surface damage. I also found that the carpeting at the East end of the room was still intact. The furnishings at the West end of the room had sustained serious damage. In the Southwest corner of the room I found a washing machine. This washing machine was severely discolored on the North side. Immediately next to this washing machine I found springs and small pieces of wood, which appeared to be from a chair. Next to this chair on the North side I found a kerosene space heater. This space heater was severely discolored on the front and right side. The remainder of the space heater was also severely damaged. Behind the space heater was located several gallons of house paint. This house paint was severely damaged, but easily recognizable. Along the North wall of this room I found and electric range and small cabinets which had a door on top of them to utilize this area as a desk. The majority of the damage to these items was on the end facing the kerosene heater. The further East I traveled in this room during my examination I smelled a strong odor of kerosene. I found the source of this odor to be a melted plastic container containing the fuel in the East end of the room, near the television. The damage in this area was severe enough to believe that this kerosene had contributed to the damage within this area. Based on the examination of this room I feel that the fire originated in the area immeditately in front of the kerosene space heater.

I checked the control knobs to this heater, but I was unable to determine whether it was on or off. I did observe that the heater had been located only approximately 3" from the adjacent chair, which had been totally consumed leaving only a few springs and small wooden parts where it had been.

Based on the results of this investigation, it is my opinion that this fire was accidentally caused when the space heater was either placed too close to the chair and was ignited by the operating heater or the heater malfunctioned and then ignited the adjacent chair. The ensuing fire then engulfed the entire family room before spreading through the sliding glass door and damaged a large portion of the remainder of the house.

This report presented with the compliments of John R. Hackett of the Orlando Fire Department, Investigator, Arson/Bomb Squad.

The name of the user is as follows: Jill Janak

Identification of the fire is as follows: OFD Alarm #678

Description of the fire is as follows: House fire at 1234 Ample Drive at 0244 hours.

The cause of the fire is as follows: HOT (97%) GAS (45%)

APPENDIX B

KNOWLEDGE BASE LISTING

Rule Group CHARRULES

RULE002 [CHARRULES]

PREMISE: ($AND (SAME CNTXT ELEC-SUPP YES)
(SAME CNTXT ELECT YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE ELECT TALLY 1000))

RULE003 [CHARRULES]

PREMISE: ($AND (SAME CNTXT GAS-SUPP YES)
(SAME CNTXT GAS YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE GAS TALLY 1000))

RULE004 [CHARRULES]

PREMISE: ($AND (SAME CNTXT SMOKER YES)
(SAME CNTXT SMOKE YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE SMOKE TALLY 1000))

RULE005 [CHARRULES]

PREMISE: ($AND (SAME CNTXT MATCHES YES)
(SAME CNTXT SMOKE YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE SMOKE TALLY 1000))

RULE006 [CHARRULES]

PREMISE: ($AND (SAME CNTXT ACTIVITY YES)
(SAME CNTXT LIGHT YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE LIGHT TALLY 1000))

RULE007 [CHARRULES]

PREMISE: ($AND (SAME CNTXT SUNOUT YES) (SAME CNTXT SUN YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE SUN TALLY 1000))

RULE008 [CHARRULES]

PREMISE: ($AND (SAME CNTXT SURFACE YES)
(SAME CNTXT HOT YES))
ACTION: (DO-ALL (CONCLUDE CNTXT SOURCE HOT TALLY 1000))

```
RULE009 [CHARRULES]
-------

PREMISE:  ($AND (SAME CNTXT FLAME YES) (SAME CNTXT HOT YES))
ACTION:  (DO-ALL (CONCLUDE CNTXT SOURCE HOT YES 1000))


RULE011 [CHARRULES]
-------

PREMISE:  ($AND (NOTSAME CNTXT GAS-SUPP YES)
            (NOTSAME CNTXT ELEC-SUPP YES)
            (SAME CNTXT SPON YES))
ACTION:  (DO-ALL (CONCLUDE CNTXT SOURCE SPON TALLY 1000))


RULE012 [CHARRULES]
-------

PREMISE:  ($AND (NOTSAME CNTXT ACTIVITY YES)
            (NOTSAME CNTXT SMOKE YES) (SAME CNTXT SPON YES))
ACTION:  (DO-ALL (CONCLUDE CNTXT SOURCE SPON TALLY 1000))


RULE013 [CHARRULES]
-------

PREMISE:  ($AND (NOTSAME CNTXT SUNOUT YES)
            (NOTSAME CNTXT HOT YES) (NOTSAME CNTXT ANY YES)
            (SAME CNTXT SPON YES))
ACTION:  (DO-ALL (CONCLUDE CNTXT SOURCE SPON TALLY 1000))


RULE200 [CHARRULES/antecedent]
-------

PREMISE:  ($AND (LESSP* (MEASURE1 CNTXT SMOKE) 500))
ACTION:  (DO-ALL (CONCLUDE CNTXT SOURCE ELECT TALLY 1000)
           (SPRINT "Way to go!!!"))
ANTECEDENT:  T


RULE250 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT ELECT))
            (SAME CNTXT SECOND))
ACTION:  (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))


RULE251 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT SUN))
            (SAME CNTXT SECOND))
ACTION:  (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))
```

```
RULE252 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT ANY))
                (SAME CNTXT SECOND))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE253 [CHARRULES]
-------
PREMISE:  ($AND
            (LESSP* 500 (MEASURE1 CNTXT LIGHT)
              (SAME CNTXT LIGHT)))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE254 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT HOT))
                (SAME CNTXT SECOND))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE255 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT SPOT))
                (SAME CNTXT SECOND))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE256 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 5000 (MEASURE1 CNTXT GAS))
                (SAME CNTXT SECOND))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE257 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 500 (MEASURE1 CNTXT SMOKE))
                (SAME CNTXT SECOND))
ACTION:   (DO-ALL (CONCLUDE CNTXT AGAIN YES TALLY 1000))

RULE258 [CHARRULES]
-------
PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT ELECT))
                (SAME CNTXT ELECT))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))
```

```
RULE259 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT SUN))
             (SAME CNTXT SUN))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE260 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT ANY))
             (SAME CNTXT ANY))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE261 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT LIGHT))
             (SAME CNTXT LIGHT))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE262 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT HOT))
             (SAME CNTXT HOT))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE263 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT SPOT))
             (SAME CNTXT HOT))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE264 [CHARRULES]
-------

PREMISE:  ($AND
             (LESSP* 700 (MEASURE1 CNTXT GAS)
               (SAME CNTXT GAS)))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))

RULE265 [CHARRULES]
-------

PREMISE:  ($AND (LESSP* 700 (MEASURE1 CNTXT SMOKE))
             (SAME CNTXT SMOKE))
ACTION:   (DO-ALL (CONCLUDE CNTXT DUMMY YES TALLY 1000))
```

```
RULE266 [CHARRULES/antecedent]
-------

PREMISE:  ($AND (ONCEKNOWN CNTXT ELECT))
ACTION:  (DO-ALL (SPRINT1 "WAY TO GO")
           (MPRINT1 (VAL CNTXT SOURCE)))
ANTECEDENT:  T


   Rule Group  ELECTRICITYRULES

RULE030 [ELECTRICITYRULES]
-------

PREMISE:  ($AND (SAME CNTXT APPLI-PRESENT YES)
             (SAME CNTXT APPLI-ON YES)
             (SAME CNTXT APPLI-FIRE-DAMAGED YES))
ACTION:  (DO-ALL (CONCLUDE CNTXT APPLIANCE YES TALLY 1000))


RULE031 [ELECTRICITYRULES]
-------

PREMISE:  ($AND (SAME CNTXT APPLI-ON YES)
             (SAME CNTXT APPLI-HEAT YES)
             (SAME CNTXT APPLI-BURNT-OUTSIDE YES))
ACTION:  (DO-ALL
            (CONCLUDE CNTXT APPLIANCEPRODUCED-PARTIAL YES
            TALLY 900))


RULE032 [ELECTRICITYRULES]
-------

PREMISE:  ($AND (SAME CNTXT APPLI-PRESENT YES)
             (SAME CNTXT APPLIANCEPRODUCED-PARTIAL YES)
             (SAME CNTXT FLAMM-NEAR-BY))
ACTION:  (DO-ALL
            (CONCLUDE CNTXT APPLIANCEPRODUCED YES TALLY 1000))


RULE033 [ELECTRICITYRULES]
-------

PREMISE:  ($AND (SAME CNTXT APPLI-PRESENT YES)
             (SAME CNTXT APPLIANCEPRODUCED-PARTIAL YES))
ACTION:  (DO-ALL
            (CONCLUDE CNTXT APPLIANCEPRODUCED YES TALLY 850))
```

```
RULE034 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT WINDING-MELTED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT MOTOR YES TALLY 850))


RULE034 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT WINDING-MELTED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT MOTOR YES TALLY 850))


RULE035 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTORPRODUCED-PARTIAL YES)
                (SAME CNTXT FLAMM-NEAR-BY YES))
ACTION:   (DO-ALL
             (CONCLUDE CNTXT MOTORPRODUCED YES TALLY 1000))


RULE036 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT MOTOR-BURNT-OUTSIDE YES))
ACTION:   (DO-ALL
             (CONCLUDE CNTXT MOTORPRODUCED-PARTIAL YES TALLY
             1000))


RULE037 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT SHAFT-SEIZED YES)
                (SAME CNTXT WINDING-MELTED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT MOTOR YES TALLY 1000))


RULE038 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT HIGHER-BREAKER YES)
                (SAME CNTXT OVERLOAD-PARTIAL YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT OVERLOAD YES TALLY 900))
```

```
RULE039 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT SHAFT-SEIZED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT MOTOR YES TALLY 950))

RULE039 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT MOTOR-PRESENT YES)
                (SAME CNTXT MOTOR-ON YES)
                (SAME CNTXT SHAFT-SEIZED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT MOTOR YES TALLY 950))

RULE040 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT MOTOR-PRODUCED-PARTIAL YES))
ACTION:   (DO-ALL
             (CONCLUDE CNTXT MOTOR-PRODUCED YES TALLY 850))

RULE041 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT APPLI-ON YES)
                (SAME CNTXT OVERLOAD-PARTIAL YES)
                (SAME CNTXT HIGHER-BREAKER YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT OVERLOAD YES TALLY 900))

RULE042 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT WIRE-ROUNDED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SHORT YES TALLY 950))

RULE043 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT BRASS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SHORT YES TALLY -800))

RULE044 [ELECTRICITYRULES]
-------
PREMISE:  ($AND (SAME CNTXT BRASS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT OVERLOAD YES TALLY -800))
```

```
RULE045 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT SMALL-COND YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT OVERLOAD YES TALLY 955))


RULE046 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT APPLIANCE YES)
                (SAME CNTXT APPLIANCEPRODUCED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT ELECT YES TALLY 1000))


RULE047 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT MOTOR YES)
                (SAME CNTXT MOTORPRODUCED YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT ELECT YES TALLY 1000))


RULE048 [ELECTRICITYRULES]
--------

PREMISE:  ($AND (SAME CNTXT OVERLOAD YES) (SAME CNTXT SHORT YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT ELECT YES TALLY 1000))
```

Rule Group GASRULES

```
RULE060 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT LEAK YES)
                (SAME CNTXT NAKED-FLAME YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS-PARTIAL YES TALLY 1000))


RULE061 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT VALVE-ON YES)
                (SAME CNTXT NAKED-FLAME YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS-PART YES TALLY 1000))


RULE062 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES)
                (SAME CNTXT WELL-VENT YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 800))
```

```
RULE063 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES)
                (SAME CNTXT VALVE-ON YES)
                (SAME CNTXT WELL-VENT YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 900))


RULE065 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 700))


RULE066 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES)
                (SAME CNTXT GAS-SAFETY YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 800))


RULE067 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PART YES)
                (SAME CNTXT GAS-SAFETY YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 800))


RULE068 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PART YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 700))


RULE069 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES)
                (SAME CNTXT VALVE-ON YES)
                (SAME CNTXT GAS-SAFETY YES)
                (SAME CNTXT WELL-VENT YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 1000))


RULE070 [GASRULES]
--------

PREMISE:  ($AND (SAME CNTXT GAS-PARTIAL YES)
                (SAME CNTXT VALVE-ON YES)
                (SAME CNTXT WELL-VENT YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 950))
```

RULE071 [GASRULES]

PREMISE: ($AND (SAME CNTXT SETTLE YES)
(SAME CNTXT GAS-PRESENT YES))
ACTION: (DO-ALL (CONCLUDE CNTXT GAS YES TALLY 900))

Rule Group HOTSURFACE/NAKEDFLAMERULES

RULE160 [HOTSURFACE/NAKEDFLAMERULES]

PREMISE: ($AND (SAME CNTXT HOTWATER YES)
(SAME CNTXT FLAMM-NEAR-BY YES))
ACTION: (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 800))

RULE161 [HOTSURFACE/NAKEDFLAMERULES]

PREMISE: ($AND (SAME CNTXT FIREPLACE YES)
(SAME CNTXT FLAMM-NEAR-BY YES))
ACTION: (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 850))

RULE162 [HOTSURFACE/NAKEDFLAMERULES]

PREMISE: ($AND (SAME CNTXT FIREPLACE YES)
(SAME CNTXT FLAMM-NEAR-BY YES)
(SAME CNTXT FAN-ON YES))
ACTION: (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 1000))

RULE163 [HOTSURFACE/NAKEDFLAMERULES]

PREMISE: ($AND (SAME CNTXT SPACEHEATER YES)
(SAME CNTXT FLAMM-NEAR-BY YES))
ACTION: (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 850))

RULE164 [HOTSURFACE/NAKEDFLAMERULES]

PREMISE: ($AND (SAME CNTXT SPACEHEATER YES)
(SAME CNTXT FLAMM-NEAR-BY YES)
(SAME CNTXT FAN-ON YES))
ACTION: (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 1000))

```
RULE165 [HOTSURFACE/NAKEDFLAMERULES]
--------

PREMISE:  ($AND (SAME CNTXT STOVE-ON YES)
                (SAME CNTXT FAN-ON YES)
                (SAME CNTXT FLAMM-NEAR-BY YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 900))


RULE166 [HOTSURFACE/NAKEDFLAMERULES]
--------

PREMISE:  ($AND (SAME CNTXT GASSTOVE YES)
                (SAME CNTXT FAN-ON YES)
                (SAME CNTXT FLAMM-NEAR-BY YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 1000))


RULE167 [HOTSURFACE/NAKEDFLAMERULES]
--------

PREMISE:  ($AND (SAME CNTXT MATCHES YES)
                (SAME CNTXT CHILD YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 950))


RULE168 [HOTSURFACE/NAKEDFLAMERULES]
--------

PREMISE:  ($AND (SAME CNTXT MATCHES YES)
                (SAME CNTXT CHILD YES)
                (SAME CNTXT FLAMM-NEAR-BY YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 950))


RULE169 [HOTSURFACE/NAKEDFLAMERULES]
--------

PREMISE:  ($AND (SAME CNTXT MATCHES YES)
                (SAME CNTXT CHILD YES)
                (SAME CNTXT FLAMM-NEAR-BY YES)
                (SAME CNTXT UNDERCOVER YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT HOT YES TALLY 1000))


    Rule Group  LIGHTNINGRULES

RULE120 [LIGHTNINGRULES]
--------

PREMISE:  ($AND (SAME CNTXT ACTIVITY YES)
                (SAME CNTXT THUNDER YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT LIGHT YES TALLY 900))
```

```
RULE121 [LIGHTNINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT ACTIVITY YES)
                (SAME CNTXT OZONE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT LIGHT YES TALLY 900))

RULE122 [LIGHTNINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT OZONE YES)
                (SAME CNTXT THUNDER YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT LIGHT YES TALLY 900))

RULE123 [LIGHTNINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT OZONE YES)
                (SAME CNTXT ACTIVITY YES)
                (SAME CNTXT THUNDER YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT LIGHT YES TALLY 1000))

RULE090 [SMOKINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT FURNITURE-BURNED-INSIDE YES)
                (SAME CNTXT SMOKING-AREA YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SMOKE YES TALLY 900))

RULE091 [SMOKINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT FURNITURE-BURNED-INSIDE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SMOKE YES TALLY 800))

RULE093 [SMOKINGRULES]
-------
PREMISE:  ($AND (SAME CNTXT FURNITURE-BURNED-INSIDE YES)
                (SAME CNTXT INCUBATION YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SMOKE YES TALLY 1000))
```

Rule Group SPONTANEOUSRULES

```
RULE190 [SPONTANEOUSRULES]
-------
PREMISE:  ($AND (SAME CNTXT VEG1 YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 800))
```

```
RULE191 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEG2 YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 600))


RULE192 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEG2 YES) (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE SPON YES TALLY 850))


RULE193 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEG1 YES) (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 950))


RULE194 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEG1 YES) (SAME CNTXT VEG2 YES)
             (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 1000))


RULE195 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEGP2 YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 500))


RULE196 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEGP2 YES) (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 750))


RULE197 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEGP1 YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 700))


RULE198 [SPONTANEOUSRULES]
--------

PREMISE:  ($AND (SAME CNTXT VEGP1 YES) (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 800))
```

```
RULE199 [SPONTANEOUSRULES]
--------
PREMISE:  ($AND (SAME CNTXT VEGP1 YES)
                (SAME CNTXT VEGP2 YES) (SAME CNTXT RAGS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SPON YES TALLY 900))
```

Rule Group SUNSRAYSRULES

```
RULE140 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT BULLSEYE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 900))

RULE141 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT CONCAVE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 900))

RULE142 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT FISHBOWL YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 800))

RULE143 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT GLASSVASE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 800))

RULE144 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT DRINKGLASS YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 800))

RULE145 [SUNSRAYSRULES]
--------
PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT MIRROR YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 900))
```

```
RULE146 [SUNSRAYSRULES]
-------

PREMISE:  ($AND (SAME CNTXT BULLSEYE YES)
                (SAME CNTXT FISHBOWL YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 1000))


RULE147 [SUNSRAYSRULES]
-------

PREMISE:  ($AND (SAME CNTXT CONCAVE YES)
                (SAME CNTXT FISHBOWL YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 1000))


RULE148 [SUNSRAYSRULES]
-------

PREMISE:  ($AND (SAME CNTXT BULLSEYE YES)
                (SAME CNTXT GLASSVASE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 1000))


RULE150 [SUNSRAYSRULES]
-------

PREMISE:  ($AND (SAME CNTXT SUNOUT YES)
                (SAME CNTXT CONCAVE YES)
                (SAME CNTXT GLASSVASE YES))
ACTION:   (DO-ALL (CONCLUDE CNTXT SUN YES TALLY 1000))
```

Parameter Group CHAR-PARMS

```
ACTIVITY [CHAR-PARMS]
--------

TRANS:    (lightning in the area)
PROMPT:   (Did the Weather Bureau record any lightning in
           the area?)
USED-BY:  (RULE006 RULE120 RULE121 RULE123)


AGAIN [CHAR-PARMS]
-----

UPDATED-BY:  (RULE250 RULE251 RULE252 RULE253 RULE254
              RULE255 RULE256 RULE257)


ANY [CHAR-PARMS]
---

TRANS:    (other sources of ignition)
USED-BY:  (RULE013 RULE010 RULE252 RULE260)
```

DESCRIPTION [CHAR-PARMS]

TRANS: (description of the fire)
PROMPT: (Give a brief description of the fire.)
REPROMPT: (Give date, address, type of fire etc.)
ASKFIRST: T
EXPECT: any
MULTIVALUED: ASK-ALL

DUMMY [CHAR-PARMS]

UPDATED-BY: (RULE258 RULE259 RULE260 RULE261 RULE262
RULE263 RULE264 RULE265)

ELEC-SUPP [CHAR-PARMS]

TRANS: (electricity supplied to building)
PROMPT: (Was there an electrical supply to the residence?)
USED-BY: (RULE002)

ELECT [CHAR-PARMS]

TRANS: (the source of ignition was some electrical failure)
ANTECEDENT-IN: (RULE266)
USED-BY: (RULE002 RULE011 RULE250 RULE258)
UPDATED-BY: (RULE046 RULE047 RULE048)

FLAME [CHAR-PARMS]

TRANS: (open flame)
PROMPT: (Were there any open flames present, fire place,
candles etc.)
USED-BY: (RULE009)

FLAMM-NEAR-BY [CHAR-PARMS]

TRANS: (flammable material nearby)
PROMPT: (Was there any flammable material close to the
origin of the fire?)
USED-BY: (RULE032 RULE035 RULE160 RULE161 RULE162 RULE163
RULE164 RULE165 RULE166 RULE168 RULE169)

GAS [CHAR-PARMS]

TRANS: (the source of ignition was from a failure in the gas supply)
INITIALDATA: NIL
GOALS: (GAS)
RULETYPES: (GASRULES)
PARMGROUP: GAS-PARMS
PRINTID: GAS-
PROMPT2ND: NIL
PROMPT1ST: NIL
ASSOCWITH: (CHAR)
USED-BY: (RULE003 RULE011 RULE256 RULE264)
UPDATED-BY: (RULE062 RULE063 RULE065 RULE066 RULE067 RULE068 RULE069 RULE070 RULE071)

GAS-SUPP [CHAR-PARMS]

TRANS: (gas is used in the residence)
PROMPT: (Was there a gas supply in the residence?)
USED-BY: (RULE003)

HOT [CHAR-PARMS]

TRANS: (the fire was caused by the material first ignited touching a hot surface or a flame)
USED-BY: (RULE013 RULE008 RULE009 RULE254 RULE262 RULE263)
UPDATED-BY: (RULE160 RULE161 RULE162 RULE163 RULE164 RULE165 RULE166 RULE168 RULE167 RULE169)

ID [CHAR-PARMS]

TRANS: (identification of the fire)
PROMPT: (Enter the case number or intification)
REPROMPT: (The reference number of this investigation)
ASKFIRST: T
EXPECT: ANY
MULTIVALUED: ASK-ALL

LIGHT [CHAR-PARMS]

TRANS: (the source of ignition was lightning)
USED-BY: (RULE006 RULE012 RULE253 RULE261)

MATCHES [CHAR-PARMS]

TRANS: (matches being used in area)
PROMPT: (Was anyone using matches in area?)
USED-BY: (RULE005 RULE168 RULE167 RULE169)

NAME [CHAR-PARMS]

TRANS: (the name of the user)
PROMPT: T
REPROMPT: (The name of the person using the system at present.)
ASKFIRST: T
EXPECT: ANY
MULTIVALUED: ASK-ALL

SECOND [CHAR-PARMS]

TRANS: (other context)
PROMPT: (Do you wish to have futher consultation ?)
REPROMPT: (Would you like to have the consultation terminated now, or do you wish to be questioned further?)
USED-BY: (RULE250 RULE251 RULE252 RULE254 RULE255 RULE256 RULE257)

SMOKE [CHAR-PARMS]

TRANS: (the source of ignition was a form of smoking material)
ANTECEDENT-IN: (RULE200)
USED-BY: (RULE004 RULE005 RULE012 RULE257 RULE265)
UPDATED-BY: (RULE091 RULE093 RULE090)

SMOKER [CHAR-PARMS]

TRANS: (a smoker in room of origin)
PROMPT: (Was there a smoker in the room at least 1 hour before the fire started?)
USED-BY: (RULE004)

SOURCE [CHAR-PARMS]

TRANS: (the cause of the fire)
LEGALVALS: (ELECT GAS SMOKE MATCHES LIGHT HOT SUN ANY)
UPDATED-IN: (RULE200 RULE266)
UPDATED-BY: (RULE002 RULE003 RULE004 RULE005 RULE006
RULE007 RULE008 RULE010 RULE011 RULE012
RULE013 RULE009)

SPON [CHAR-PARMS]

TRANS: (the source of ignition was spontaneous combustion)
USED-BY: (RULE011 RULE012 RULE013 RULE255 RULE263)
UPDATED-BY: (RULE190 RULE191 RULE193 RULE194 RULE195
RULE196 RULE197 RULE198 RULE199)

SUN [CHAR-PARMS]

TRANS: (the fire was caused from rays of sun focussing on
the material first ignited)
USED-BY: (RULE007 RULE013 RULE145 RULE251 RULE259)
UPDATED-BY: (RULE140 RULE141 RULE142 RULE143 RULE144
RULE146 RULE147 RULE148 RULE150 SREEMARK
RULE145)

SUNOUT [CHAR-PARMS]

TRANS: (sun shining for at least 4 hours)
PROMPT: (Was there sunshine for at least 3 hours?)
USED-BY: (RULE007 RULE141 RULE140 RULE142 RULE143 RULE144
RULE150)

SURFACE [CHAR-PARMS]

TRANS: (hot surfaces)
PROMPT: (Were there any hot surfaces present?)
USED-BY: (RULE008)

Parameter Group CONTEXTTYPES

CHAR [CONTEXTTYPES]

TRANS: (the source of ignition)
OFFSPRING: (ELECTRICITY GAS SMOKING LIGHTNING SUNSRAYS
HOTSURFACE/NAKEDFLAME SPONTANEOUS MISCELLANEOUS)
UNIQUE: T
DISPLAYRESULTS: T
GOALS: (NAME ID DESCRIPTION SOURCE)
RULETYPES: (CHARRULES)
PARMGROUP: CHAR-PARMS
PRINTID: CHAR-
PROMPTEVER: (CHAR aids the fire investigator in determining
the source of residential fires. The user
should have the fire report at hand to answer
the questions that follow.)
INITIALDATA: (NAME DESCRIPTION ID)

ELECTRICITY [CONTEXTTYPES]

TRANS: (the fire was caused by some electrical failure)
INITIALDATA: NIL
GOALS: (ELECT)
RULETYPES: (ELECTRICITYRULES)
PARMGROUP: ELECTRICITY-PARMS
PRINTID: ELECTRICITY-
PROMPTEND: NIL
PROMPTLIST: NIL
ASSOCWITH: (CHAR)

GAS [CONTEXTTYPES]

TRANS: (the source of ignition was from a failure in the
gas supply)
INITIALDATA: NIL
GOALS: (GAS)
RULETYPES: (GASRULES)
PARMGROUP: GAS-PARMS
PRINTID: GAS-
PROMPTEND: NIL
PROMPTLIST: NIL
ASSOCWITH: (CHAR)
USED-BY: (RULE003 RULE011 RULE256 RULE264)
UPDATED-BY: (RULE062 RULE063 RULE065 RULE066 RULE067
RULE068 RULE069 RULE070 RULE071)

HOTSURFACE/NAKEDFLAME [CONTEXTTYPES]

TRANS: (the source of ignition was from a hot surface or a naked flame)
INITIALDATA: NIL
GOALS: (HOT)
RULETYPES: (HOTSURFACE/NAKEDFLAMERULES)
PARMGROUP: HOTSURFACE/NAKEDFLAME-PARMS
PRINTID: HOTSURFACE/NAKEDFLAME-
PROMPT2ND: NIL
PROMPT1ST: NIL
ASSOCWITH: (CHAR)

LIGHTNING [CONTEXTTYPES]

TRANS: (the cause of the fire was lightning)
INITIALDATA: NIL
GOALS: (LIGHT)
RULETYPES: (LIGHTNINGRULES)
PARMGROUP: LIGHTNING-PARMS
PRINTID: LIGHTNING-
PROMPT2ND: NIL
PROMPT1ST: NIL
ASSOCWITH: (CHAR)
UPDATED-BY: (RULE120 RULE121 RULE122 RULE123)

MISCELLANEOUS [CONTEXTTYPES]

TRANS: (other sources of ignition)
INITIALDATA: NIL
GOALS: (ANY)
RULETYPES: (MISCELLANEOUSRULES)
PARMGROUP: MISCELLANEOUS-PARMS
PRINTID: MISCELLANEOUS-
PROMPT2ND: NIL
PROMPT1ST: NIL
ASSOCWITH: (CHAR)

SMOKING [CONTEXTTYPES]

TRANS: (the source of the fire was some smoking material)
INITIALDATA: NIL
GOALS: (SMOKE)
RULETYPES: (SMOKINGRULES)
PARMGROUP: SMOKING-PARMS
PRINTID: SMOKING-
PROMPT2ND: NIL
PROMPTLST: NIL
ASSOCWITH: (CHAR)

SPONTANEOUS [CONTEXTTYPES]

TRANS: (the source of ignition is spontaneous combustion)
INITIALDATA: NIL
GOALS: (SPON)
RULETYPES: (SPONTANEOUSRULES)
PARMGROUP: SPONTANEOUS-PARMS
PRINTID: SPONTANEOUS-
PROMPT2ND: NIL
PROMPTLST: NIL
ASSOCWITH: (CHAR)

SUNSRAYS [CONTEXTTYPES]

TRANS: (the cause of the fire was from sun rays focussing
on the material first ignited)
INITIALDATA: NIL
GOALS: (SUN)
RULETYPES: (SUNSRAYSRULES)
PARMGROUP: SUNSRAYS-PARMS
PRINTID: SUNSRAYS-
PROMPT2ND: NIL
PROMPTLST: NIL
ASSOCWITH: (CHAR)

Parameter Group ELECTRICITY-PARMS

APPLI-BURNT-OUTSIDE [ELECTRICITY-PARMS]

TRANS: (appliance has more damage on outside than the
inside)
PROMPT: (Was the appliance more damaged on the outside tha
n the inside?)
USED-BY: (RULE031)

APPLI-FIRE-DAMAGED [ELECTRICITY-PARMS]

TRANS: (appliance burnt from inside)
PROMPT: (Was the appliance burnt from the inside?)
USED-BY: (RULE030)

APPLI-HEAT [ELECTRICITY-PARMS]

TRANS: (heat producing appliance)
PROMPT: (Was the appliance heat producing, running hot or usually heat-producing e.g. toaster?)
USED-BY: (RULE031)

APPLI-ON [ELECTRICITY-PARMS]

TRANS: (electrical appliance on)
PROMPT: (Were there any electrical appliances being used?)
REPROMPT: (Was the control switch on, or did anyone report it as being used prior to the fire?)
USED-BY: (RULE031 RULE030 RULE041)

APPLI-PRESENT [ELECTRICITY-PARMS]

TRANS: (electrical appliance present in residence)
PROMPT: (Were there any electrical appliances in the residence?)
USED-BY: (RULE032 RULE030 RULE033)

APPLIANCE [ELECTRICITY-PARMS]

USED-BY: (RULE046)
UPDATED-BY: (RULE030)

APPLIANCEPRODUCED [ELECTRICITY-PARMS]

USED-BY: (RULE033 RULE046)
UPDATED-BY: (RULE032 RULE033)

APPLIANCEPRODUCED-PARTIAL [ELECTRICITY-PARMS]

USED-BY: (RULE032 RULE033)
UPDATED-BY: (RULE031)

BRASS [ELECTRICITY-PARMS]

TRANS: (brass found near conductors)
PROMPT: (Was there any brass found near the burnt conductors?)
USED-BY: (RULE043 RULE044)

HIGHER-BREAKER [ELECTRICITY-PARMS]

TRANS: (circuit breaker of higher amperage substituted)
PROMPT (Was a circuit breaker of higher rating substituted?)
USED-BY: (RULE038 RULE041)

MOTOR [ELECTRICITY-PARMS]

USED-BY: (RULE047)
UPDATED-BY: (RULE034 RULE037 RULE039)

MOTOR-BURNT-OUTSIDE [ELECTRICITY-PARMS]

TRANS: (appliance with motor burnt on the outside)
PROMPT: (Were there any signs of the motor being burnt on the outside?)
USED-BY: (RULE036)

MOTOR-ON [ELECTRICITY-PARMS]

TRANS: (motor of appliance running)
PROMPT: (Were there any motor powered machines being used prior to the start of the fire?)
USED-BY: (RULE034 RULE036 RULE037 RULE039)

MOTOR-PRESENT [ELECTRICITY-PARMS]

TRANS: (appliance using motor present)
PROMPT: (Were there any appliances with motors present?)
USED-BY: (RULE034 RULE036 RULE037 RULE038 RULE039)

MOTORPRODUCED [ELECTRICITY-PARMS]

USED-BY: (RULE047)
UPDATED-BY: (RULE035 RULE040)

MOTORREDUCED-PARTIAL [ELECTRICITY-PARMS]

USED-BY: (RULE035 RULE040)
UPDATED-BY: (RULE036)

OVERLOAD [ELECTRICITY-PARMS]

USED-BY: (RULE048)
UPDATED-BY: (RULE038 RULE041 RULE044 RULE045)

OVERLOAD-PARTIAL [ELECTRICITY-PARMS]

USED-BY: (RULE038 RULE041)

SHAFT-SEIZED [ELECTRICITY-PARMS]

TRANS: (shaft seized to bearings)
PROMPT: (Was the shaft seized to the bearings in any of the
electrical motors present?)
USED-BY: (RULE037 RULE039)

SHORT [ELECTRICITY-PARMS]

USED-BY: (RULE048)
UPDATED-BY: (RULE043 RULE042)

SMALL-COND [ELECTRICITY-PARMS]

TRANS: (undersized conductor)
PROMPT: (Was the electrical conductor too small for the
load?)
USED-BY: (RULE045)

WINDING-MELTED [ELECTRICITY-PARMS]

TRANS: (winding is melted)
PROMPT: (Was the winding of any motor melted?)
USED-BY: (RULE034 RULE037)

WIRE-ROUNDED [ELECTRICITY-PARMS]

TRANS: (burnt conductors rounded and fused at ends)
PROMPT: (Were there burnt conductors, near switches, outlets and breaker box, with fused rounded ends?)
USED-BY: (RULE042)

Parameter Group GAS-PARMS

GAS-PART [GAS-PARMS]

USED-BY: (RULE067 RULE068)
UPDATED-BY: (RULE061)

GAS-PARTIAL [GAS-PARMS]

USED-BY: (RULE062 RULE063 RULE065 RULE066 RULE069 RULE070)
UPDATED-BY: (RULE060)

GAS-PRESENT [GAS-PARMS]

TRANS: (gas used in building)
PROMPT: (Was gas being supplied to the residence?)
USED-BY: (RULE071)

GAS-SAFETY [GAS-PARMS]

TRANS: (safety device)
PROMPT: (Did the safety device from the gas supply fail?)
USED-BY: (RULE066 RULE067 RULE069)

LEAK [GAS-PARMS]

TRANS: (gas leak)
PROMPT: (Were there signs of a gas leak or did anyone smell gas prior to the fire?)
USED-BY: (RULE060)

NAKED-FLAME [GAS-PARMS]

TRANS: (uncovered flame)
PROMPT: (Was there a naked flame in close proximity of the point of origin?)
USED-BY: (RULE060 RULE061)

SETTLE [GAS-PARMS]

TRANS: (building settling)
PROMPT: (Is there a possibility of the building settling?)
USED-BY: (RULE071)

VALVE-ON [GAS-PARMS]

TRANS: (valve to supply)
PROMPT: (Were the controlling valves to the gas supply on?)
USED-BY: (RULE061 RULE063 RULE069 RULE070)

WELL-VENT [GAS-PARMS]

TRANS: (area well ventilated)
PROMPT: (Was the area well ventilated?)
USED-BY: (RULE062 RULE063 RULE069 RULE070)

Parameter Group HOTSURFACE/NAKEDFLAME-PARMS

CHILD [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (child present in room)
PROMPT: (Was there a child present in room prior to the fire?)
USED-BY: (RULE168 RULE167 RULE169)

FAN-ON [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (fan on)
PROMPT: (Was a fan on at the time of the fire?)
USED-BY: (RULE162 RULE164 RULE165 RULE166)

FIREPLACE [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: fireplace
PROMPT: (Was there a fireplace in the room?)
USED-BY: (RULE161 RULE162)

GASSTOVE [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (gas stove)
PROMPT: (Was a gas stove on?)
USED-BY: (RULE166)

HOTWATER [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (hot water pipe)
PROMPT: (Was there any hot surface present)
USED-BY: (RULE160)

SPACEHEATER [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (space heater)
PROMPT: (Was there a space heater being used?)
USED-BY: (RULE163 RULE164)

STOVE-ON [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (electric stove)
PROMPT: (Was an electric stove on?)
USED-BY: (RULE165)

UNDERCOVER [HOTSURFACE/NAKEDFLAME-PARMS]

TRANS: (fire started in a secluded place, like under bed,
in closet etc.)
PROMPT: (Did the fire start in a secluded place ,like under
bed, in closet etc. ?)
USED-BY: (RULE169)

Parameter Group LIGHNING-PARMS

LIGHNING [LIGHNING-PARMS]

TRANS: (the cause of the fire was lightning)
INITIALDATA: NIL
GOALS: (LIGHT)
RULETYPES: (LIGHNINGRULES)
PARMGROUP: LIGHNING-PARMS
PRINTID: LIGHNING-
PROMPT2ND: NIL
PROMPT1ST: NIL
ASSOCWITH: (CHAR)
UPDATED-BY: (RULE120 RULE121 RULE122 RULE123)

OZONE [LIGHNING-PARMS]

TRANS: (ozone smell in area)
PROMPT: (Was there the smell of ozone in the area?)
USED-BY: (RULE121 RULE122 RULE123)

THUNDER [LIGHNING-PARMS]

TRANS: (thunder in area)
PROMPT: (Was thunder heard in the area?)
USED-BY: (RULE120 RULE122 RULE123)

Parameter Group SMOKING-PARMS

FURNITURE-BURNED-INSIDE [SMOKING-PARMS]

TRANS: (furniture burned from the inside)
PROMPT: (Are there any signs that the furniture was burned
from the inside?)
USED-BY: (RULE091 RULE093 RULE090)

INCUBATION [SMOKING-PARMS]

TRANS: (incubation period)
PROMPT: (Was there a period of at least 3 hours since the
last smoker left the room?)
USED-BY: (RULE093)

SMOKING-AREA [SMOKING-PARMS]

TRANS: (area where smoking is allowed)
PROMPT: (Was smoking allowed in the area of origin?)
USED-BY: (RULE090)

Parameter Group SPONTANEOUS-PARMS

RAGS [SPONTANEOUS-PARMS]

TRANS: (rag present)
PROMPT: (Were there any rags present?)
USED-BY: (RULE192 RULE193 RULE194 RULE196 RULE198 RULE199)

VEG1 [SPONTANEOUS-PARMS]

TRANS: (any of the following oils: Linseed, Cic, Perilla, Stillingia, Hemp-seed, or Tung)
PROMPT: (Were any of the following oils present: LINSEED, CIC, HEMP-SEED, PERILLA, STILLINGIA, OR TUNG?)
USED-BY: (RULE190 RULE193 RULE194)

VEG2 [SPONTANEOUS-PARMS]

TRANS: (oils with iodine value of 100 or more)
PROMPT: (Were there any of the following oils present: COD-LIVER, POPPY-SEED, SOYA-BEAN, SEAL, WHALE (sperm) , CASTOR, OR ANY OIL OF SIMILAR COMPOSITION?)
USED-BY: (RULE192 RULE194 RULE191)

VEGP1 [SPONTANEOUS-PARMS]

TRANS: (products containing Tung, Cic, Linseed, Perilla, Stillingia, or Hemp-seed)
PROMPT: (Were there any products containing any of these oils: HEMP-SEED, CIC, TUNG, STILLINGIA, PERILLA, OR LINSEED?)
USED-BY: (RULE197 RULE198 RULE199)

VEGP2 [SPONTANEOUS-PARMS]

TRANS: (any product containing oils of iodine value of 100 or more)
PROMPT: (Were any products containing any of the following oils: POPPY-SEED, COD-LIVER, COTTON-SEED, SOYA-BEAN, SEAL, WHALE (sperm) , WALRUS, MAIZE, OLIVE SESAME, OR CASTOR?)
USED-BY: (RULE195 RULE196 RULE199)

YES [SPONTANEOUS-PARMS]

UPDATED-BY: (RULE192)

Parameter Group SUNSRAYS-PARMS

BULLSEYE [SUNSRAYS-PARMS]

TRANS: (bull's-eye window)
PROMPT: (Are any of the windows in the room of origin of the bull's-eye type?)
USED-BY: (RULE140 RULE146 RULE148)

CONCAVE [SUNSRAYS-PARMS]

TRANS: (concave type window)
PROMPT: (Are any of the windows near the point of origin concave?)
USED-BY: (RULE141 RULE147 RULE150)

DRINKGLASS [SUNSRAYS-PARMS]

TRANS: (drinking glass)
PROMPT: (Was there a drinking glass in the room?)
USED-BY: (RULE144)

FISHBOWL [SUNSRAYS-PARMS]

TRANS: (fish bowl)
PROMPT: (Was there a gold fish bowl in area?)
USED-BY: (RULE142 RULE146 RULE147)

GLASSVASE [SUNSRAYS-PARMS]

TRANS: (glass vase)
PROMPT: (Was there a glass vase in the room?)
USED-BY: (RULE143 RULE148 RULE150)

MIRROR [SUNSRAYS-PARMS]

TRANS: mirror
PROMPT: (Was there a mirror in the room?)
USED-BY: (RULE145)

System parameters

DOMAIN [SYSVARS]

Value: "CHAR: The Fire Investigator's aide"

TREEROOT [SYSVARS]

Value: CHAR

System parameters

CHARRULES [RULEGROUPS]

CONTEXT: (CHAR)
SVAL: (char)
CTRANS: "chars"
Value: (RULE002 RULE003 RULE004 RULE005 RULE006 RULE007
RULE008 RULE009 RULE010 RULE011 RULE012 RULE013
RULE200 RULE250 RULE251 RULE252 RULE253 RULE254
RULE255 RULE256 RULE257 RULE258 RULE259 RULE260
RULE261 RULE262 RULE263 RULE264 RULE265 RULE266)

ELECTRICITYRULES [RULEGROUPS]

CONTEXT: (ELECTRICITY)
SVAL: (electricity)
CTRANS: "electricitys"
Value: (RULE030 RULE031 RULE032 RULE034 RULE035 RULE036
RULE037 RULE038 RULE039 RULE033 RULE034 RULE039
RULE040 RULE041 RULE042 RULE043 RULE044 RULE045
RULE046 RULE047 RULE048)

GASRULES [RULEGROUPS]

CONTEXT: (GAS)
SVAL: (gas)
CTRANS: "gases"
Value: (RULE060 RULE061 RULE062 RULE063 RULE065 RULE066
RULE067 RULE068 RULE069 RULE070 RULE071)

HOTSURFACE/NAKEDFLAMERULES [RULEGROUPS]

CONTEXT: (HOTSURFACE/NAKEDFLAME)
SVAL: (hotsurface/nakedflame)
CTRANS: "hotsurface/nakedflames"
Value: (RULE160 RULE161 RULE162 RULE163 RULE164 RULE165
RULE166 RULE167 RULE168 RULE169)

LIGHTNINGRULES [RULEGROUPS]

CONTEXT: (LIGHTNING)
SVAL: (lightning)
CTRANS: "lightnings"
Value: (RULE120 RULE121 RULE122 RULE123)

MISCELLANEOUSRULES [RULEGROUPS]

CONTEXT: (MISCELLANEOUS)
SVAL: (miscellaneous)
CTRANS: "miscellaneouses"
Value: NIL

PAMRULES [RULEGROUPS]

CTRANS: "pams"
SVAL: (pam)
CONTEXT: (PAM)
Value: NIL

SMOKINGRULES [RULEGROUPS]

CONTEXT: (SMOKING)
SVAL: (smoking)
CTRANS: "smokings"
Value: (RULE090 RULE091 RULE093)

SPONTANEOUSRULES [RULEGROUPS]

CONTEXT: (SPONTANEOUS)
SVAL: (spontaneous)
CTRANS: "spontaneouses"
Value: (RULE190 RULE191 RULE192 RULE193 RULE194 RULE195
RULE196 RULE197 RULE198 RULE199)

SUNSRAYSRULES [RULEGROUPS]

CONTEXT: (SUNSRAYS)
SVAL: (sunsrays)
CTRANS: "sunsraysses"
Value: (RULE140 RULE141 RULE142 RULE143 RULE144 RULE145
RULE146 RULE147 RULE148 RULE150)

System parameters

CHAR-PARMS [PARMGROUPS]

Value: (SOURCE NAME DESCRIPTION ID ELEC-SUPP ELECT GAS
SMOKE LIGHT FLAMM-NEAR-BY SUN HOT SPON ANY GAS-SUPP
SMOKER MATCHES ACTIVITY SUNOUT SURFACE FLAME AGAIN
SECOND DUMMY)

CONTEXTTYPES [PARMGROUPS]

Value: (CHAR ELECTRICITY GAS SMOKING LIGHINING SUNSRAYS
HOTSURFACE/NAKEDFLAME SPONTANEOUS MISCELLANEOUS)

ELECTRICITY-PARMS [PARMGROUPS]

Value: (APPLI-FIRE-DAMAGED APPLI-ON APPLI-PRESENT APPLIANCE
APPLI-BURNT-OUTSIDE APPLI-HEAT
APPLIANCEPRODUCED-PARTIAL APPLIANCEPRODUCED
MOTOR-ON MOTOR-PRESENT MOTOR WINDING-MELTED
MOTORPRODUCED-PARTIAL MOTORPRODUCED
MOTOR-BURNT-OUTSIDE SHAFT-SEIZED OVERLOAD-PARTIAL
HIGHER-BREAKER OVERLOAD WIRE-ROUNDED SHORT BRASS
SMALL-COND)

GAS-PARMS [PARMGROUPS]

Value: (NAKED-FLAME LEAK GAS-PARTIAL VALVE-ON WELL-VENT GAS-PRESENT GAS-PART GAS-SAFETY SETTLE)

HOTSURFACE/NAKEDFLAME-PARMS [PARMGROUPS]

Value: (HOTWATER FIREPLACE FAN-ON SPACEHEATER STOVE-ON GASSTOVE CHILD UNDERCOVER)

LIGHTNING-PARMS [PARMGROUPS]

Value: (THUNDER LIGHTNING OZONE)

SMOKING-PARMS [PARMGROUPS]

Value: (SMOKING-AREA FURNITURE-BURNED-INSIDE INCUBATION)

SPONTANEOUS-PARMS [PARMGROUPS]

Value: (VEG1 VEG2 RAGS YES VEGP2 VEGP1)

SUNSRAYS-PARMS [PARMGROUPS]

Value: (BULLSEYE CONCAVE FISHBOWL GLASSVASE DRINKGLASS MIRROR)

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